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A F T E R N O O N S E S S I O N

1:31 p.m.

THE VIDEO OPERATOR: This is videotape number 5, the continuation of the deposition of Mr. Knudson. Today is July 13th, 1995. The time on the screen is 1:31:13. You're on the record.

D O N A L D K N U D S O N,
resumed, having been previously duly sworn, was examined and testified further as follows:

CONTINUED EXAMINATION

BY MR. ROGERS:

Q. Mr. Knudson, I would like to return to what's been marked -- oh, I apologize. Before I start, there is a housecleaning matter that Mr. Killory would like to take up with David Murphy.

MR. KILLORY: David, based on our conversations before we recommenced this afternoon and my conversations with your colleague, Vineet Bhatia, over the lunch break, there were two minor housekeeping items, the first of which was, Exhibit Number 3 to the Cook deposition, which I had not had an extra copy of,

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01:31:52 2 I gave to you yesterday, and I believe that's
01:31:54 3 consistent with your recollection. And you'll
01:31:54 4 forward it to Vineet?

01:31:56 5 MR. MURPHY: That's correct.

01:31:58 6 MR. KILLORY: The other matter was
01:32:00 7 also as a result of the Cook deposition. There
01:32:00 8 was an exhibit, the number of which neither
01:32:04 9 Vineet nor I could recall^{at the moment}, but it's an exhibit
01:32:08 10 bearing the Bates stamps PA 369260 through 63
01:32:10 11 with the corresponding Philip Morris production
01:32:16 12 number 2031128292 through 95.

:32:20 13 The third page of that exhibit, which
01:32:26 14 is Bates stamped 369262, and with a corresponding
01:32:32 15 production number 2031128294, had some
01:32:34 16 handwritten notations in the lower right hand
01:32:38 17 corner, and specifically the particular notation
01:32:40 18 I'm referring to was a handwritten circle and
01:32:44 19 beside it the words "Nicotine citrate."

01:32:46 20 And I believe I asked several
01:32:48 21 questions at the deposition. The witness didn't
01:32:50 22 recognize the handwriting. In fact, based on my
01:32:54 23 review of documents, assisting Mr. Rogers in this
01:32:58 24 deposition revealed to me those notations came I
:33:00 25 believe from someone at our office reviewing

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those documents.

I in fact used a copy that had just those notations, which come from us. And so to correct the record, Vineet and I agreed that the appropriate thing would be to have ABC deliver to Philip Morris counsel a corrected page to be inserted in that exhibit in the official transcript. And we will make sure that the official exhibit also has that ^{corrected} ~~correct~~ page inserted in the exhibit.

MR. MURPHY: As you and Mr. Bhatia have worked it out is acceptable to me.

Q. Thank you for your indulgence, Mr. Knudson. Let's return to Knudson Exhibit Number 15, which is the memo from W. F. Kuhn to Ms. Claire Carcich.

A. That would be Exhibit 15?

Q. Correct. If you'll turn to the second page, PB 205038, and the reference on the top of the page to ADV tar, have you ever seen the abbreviation ADV used with the word "tar" to refer to advertised tar?

MR. MURPHY: Objection. Asked and answered. You can answer again.

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01:34:52 2 A. I believe I stated before that I
01:34:56 3 don't have a recollection of seeing that
01:35:04 4 abbreviation, and at the same time being aware
01:35:08 5 that that stood for advertised tar.

01:35:14 6 Q. Do you know of any instance based
01:35:18 7 upon your experience at Philip Morris with
01:35:22 8 respect to Philip Morris domestic cigarettes in
01:35:28 9 which the tar target exceeded the advertised tar
01:35:30 10 level?

01:35:40 11 A. I believe in my experience with
01:35:46 12 Philip Morris, that I have been aware of cases in
:35:52 13 which the tar as determined -- the tar delivery
01:35:56 14 as determined by the FTC method on domestic
01:36:08 15 product exceeded the tar target for that product,
01:36:12 16 which presumably would be consistent with the
01:36:12 17 advertised tar level.

01:36:14 18 MR. MURPHY: Mr. Rogers asked you a
01:36:20 19 different question. This document uses the term
01:36:24 20 "tar target" as we discussed it in prior
01:36:26 21 testimony. And your question, I think, Alex, was
01:36:30 22 the tar target exceeding an advertised or the
01:36:30 23 advertised tar level.

01:36:32 24 MR. ROGERS: That's correct. That
:36:34 25 was my question.

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01:36:36 2 A. I'm sorry. I don't have a
01:36:42 3 recollection of the tar target. I guess I don't
01:36:46 4 have a recollection of making any comparisons of
01:36:50 5 tar targets to, quote, advertised tar numbers.

01:36:54 6 Q. And let's return to your answer
01:36:58 7 before in which you said, "I've been aware of
01:37:00 8 cases in which the tar as determined, the tar
01:37:04 9 delivery as determined by the FTC method on
01:37:08 10 domestic product exceeded the tar target for that
01:37:10 11 product."

01:37:14 12 Does Philip Morris do anything upon
:37:16 13 discovering in those cases of which you are aware
01:37:20 14 that the tar delivery is determined by the FTC
01:37:24 15 method exceeds the tar target for that product?

01:37:26 16 MR. MURPHY: I object to the form of
01:37:26 17 the question. If you understand the question,
01:37:30 18 you can answer.

01:37:34 19 A. It is my understanding that there is
01:37:44 20 an effort made to monitor the long term average
01:37:52 21 tar delivery for packings, "packings" meaning
01:37:58 22 different product configurations, for the purpose
01:38:08 23 of comparing that with the tar targets
01:38:10 24 established for those packings or brands.

:38:20 25 Q. When you say "the long term average

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tar delivery," what period of time are you
contemplating for long term?

MR. MURPHY: I object to the form of
the question, and the phrasing, "are you
contemplating." Are you asking him if he knows
what the period of time is?

Q. I'm sorry. When you refer to long
term average tar delivery, what do you mean by
"long term"?

A. My reference is simply that my
understanding is that it is appropriate to look
at more than singular values of smoke delivery in
terms of making any kind of an assessment as to
whether the delivery is in fact inconsistent with
the tar target.

Q. Roughly speaking, what period of time
do you mean when you're saying "long term average
tar delivery"?

MR. MURPHY: I object to the form of
the question. If you understand the question,
you can answer.

A. A question as to the time frame that
we're speaking of, of my knowledge?

Q. Let me rephrase the question. You

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01:39:56 2 indicated that upon individual measurements,
01:40:00 3 there may -- your testimony was it's appropriate
01:40:02 4 to look at more than singular values of smoke
01:40:04 5 delivery in terms of making any kind of
01:40:06 6 assessment as to whether delivery is in fact
01:40:10 7 inconsistent with tar target.

01:40:18 8 My question now is, if you discover
01:40:22 9 in testing that the delivery is in fact
01:40:26 10 inconsistent with the tar target repeatedly over
01:40:30 11 a period of days or weeks or months, and I'm
01:40:34 12 asking you for the time period, how long does
:40:42 13 that inconsistency -- and by "inconsistency" I
01:40:44 14 mean delivery is in fact inconsistent with tar
01:40:46 15 target -- how long does that inconsistency have
01:40:52 16 to go on before something is done about altering
01:40:54 17 the product?

01:40:54 18 MR. MURPHY: Objection to form. You
01:40:56 19 can answer.

01:41:02 20 A. And I guess my quandary is a question
01:41:06 21 of my knowledge and understanding as I sit here
01:41:16 22 today, as it applies to practices that we may
01:41:18 23 utilize or that I may have become aware of in
01:41:24 24 recent time frame versus my awareness at some
:41:24 25 time in the past.

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01:41:30 Q. For instance, if the tar delivery is
01:41:42 considered out of spec, for what period of time
01:41:46 does the tar delivery have to be inconsistent
01:41:50 with the tar target before reaching the
01:41:52 conclusion that tar delivery is out of spec?

01:41:54 MR. MURPHY: Objection to form. You
01:41:54 can answer.

01:41:58 A. Again, I have the quandary that I
01:42:02 need some counsel on, and maybe we need to go off
01:42:04 the record, and maybe I need to talk to my
01:42:04 counsel.

:42:14 In 1993, when the manufacturing
01:42:14 specification function became part of my area of
01:42:18 responsibility, obviously I began to go through a
01:42:22 learning curve on some activities that I wasn't
01:42:26 particularly aware of prior to that. Said
01:42:28 learning curve has continued up to the present
01:42:34 date, as well as there have been changes within
01:42:40 our approach that would impact upon the answer to
01:42:42 the question that you're asking.

01:42:46 Q. Consistent with the objections of
01:42:48 your counsel during the course of this testimony,
01:42:54 let's limit it to March 24, 1994, if you can,
:42:58 sitting here today, assess your knowledge and

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position on the learning curve up to that point,
if you could answer my question.

MR. MURPHY: Objection to form. If
you understand the question, you can answer. As
of March 24 --

A. Having gone through all that
clarification, if I could now get you to repeat
the question.

Q. Sure. If the tar delivery is
considered out of spec, for what period of time
does the tar delivery have to be inconsistent
with the tar target before reaching the
conclusion that tar delivery is out of spec?

And I'm asking that question based
upon your prior testimony about singular
instances. And now I'm asking for the period of
time before reaching the conclusion that tar
delivery is out of spec.

MR. MURPHY: I object to the form. I
think the question is still a bit confusing. But
if the witness understands what he's being asked,
he can answer.

A. I'm trying to frame this so that I
can, I think, properly answer the question that

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you've posed. The FTC testing protocol results in a tar value for a given sample of cigarettes that have been subjected to that smoking.

The practice and procedures around the definition of what was out of spec as opposed to the target, where obviously a specification would include a plus or minus range around that target, and the number of samples or from what time duration those samples came in order to reach a conclusive decision that what was being observed wasn't either an anomaly of a one-time production or an analysis anomaly, was obviously a point of concern and consideration.

Unfortunately, I cannot answer definitively as to how many samples and of what duration those samples would have been taken over that would represent a basis for saying that the product was in fact truly out of specification.

Q. What would be your best estimate of the number of samples for the duration that those samples would have to be taken?

MR. MURPHY: Objection. You can answer if you're able to estimate.

A. I think with any test that you're

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faced with a number of variables that I'm not fully aware of with respect to FTC testing or even the sampling as it relates to FTC testing.

Without knowing the ^{specific} ~~specification~~² frequency with which that testing was being done, the size of the population being tested, the size of the sample being evaluated, there are a number of statistical techniques that can be applied to define the likelihood that a result is significant and it's significantly different from a result that would be within range.

But without having all that information, I wouldn't even attempt to estimate that.

Q. Is that analysis, and the gathering of that information, part of quality assurance and specification systems?

MR. MURPHY: Objection to form. You can answer.

A. The assessment of the conformance to specification of the FTC tar delivery for domestic brands, with the understanding that that actual -- the service of providing that analytical service is done elsewhere, but the

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analysis of that resultant data over some time period and the assessment as to whether a value represents an anomaly or an actual statistically valid excursion beyond some limits, is one of the responsibilities within the manufacturing specifications group.

Q. And that's --

A. Which is a part of the quality and specification systems organization.

Q. Have you ever heard the expression "nicotine follows tar"?

MR. MURPHY: Objection to form. You can answer if you understand the question.

A. I can't say with any surety that I've heard the expression -- that particular expression.

Q. To measure tar using the FTC method, do you have to measure nicotine? I know you testified earlier that you do measure nicotine. Do you have to measure nicotine in order to measure tar?

MR. MURPHY: Objection to form. You can answer.

A. I have to be clear that my

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familiarity with the FTC smoking method and the details thereof are quite limited.

But my basic understanding is that, as I stated before, the calculation of FTC tar is based on actually making several other measurements and then going through a subtractive process to calculate the FTC tar, those other measurements being the weight of the total condensate, the weight of or the mass of water and the mass of nicotine in that condensate, such that the subtraction of those two components would give you the resultant tar measure.

Q. Does Philip Morris collect data on the nicotine to tar ratio of its domestic brands?

A. Philip Morris certainly accumulates data on the measurements that are made as part of the FTC smoking analysis, which would mean water, nicotine -- total condensate, water, nicotine, and tar. As such, one might construe that in fact the data is there to, quote, see the ratio or relationships of those materials to each other.

Q. And specifically, the relationship

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01:50:46 2 between nicotine and tar, is there analysis of
01:50:48 3 the nicotine to tar ratio, putting aside total
01:50:50 4 condensate and water?

01:50:52 5 MR. MURPHY: Objection to form. What
01:50:56 6 do you mean by "analysis"? Is this a different
01:50:56 7 question from your prior question?

01:50:58 8 MR. ROGERS: I apologize.

01:51:00 9 Q. Does Philip Morris collect that data
01:51:02 10 and make a specific comparison between nicotine
01:51:06 11 and tar, putting aside total condensate and
01:51:10 12 water, for the purposes of arriving at a nicotine
:51:14 13 to tar ratio for its domestic brands?

01:51:14 14 MR. MURPHY: For the purpose of
01:51:16 15 arriving at, or does it collect information in
01:51:20 16 the form of ratios? Those are two different
01:51:22 17 questions.

01:51:22 18 MR. ROGERS: Let's take your second
01:51:24 19 question first.

01:51:26 20 Q. Does it collect information in the
01:51:28 21 form of nicotine to tar ratios?

01:51:32 22 A. I don't have any awareness of that.

01:51:36 23 Q. You don't know one way or the other?

01:51:36 24 A. I really don't.

:51:58 25 Q. Prior to March 24, 1994, roughly how

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many people worked in the research and

development organization at Philip Morris?

MR. MURPHY: Objection to the form.

Employees of all types, or are we talking about

professional staff? It just may be a question of

an ambiguity of the question.

MR. ROGERS: Let's limit it to

professional staff.

A. The only time period where I would

have any significant recollection as to the

population within R&D would have been the time

period during which I was in R&D. I don't

believe that recollection includes any sort of a

breakdown as to the types of employees that

worked in R&D.

Q. Do you have a recollection of a total

number during the time in which you were in the

R&D department?

A. The number or the order of magnitude

number that I have recollection of would have

been what we would refer to as the total

authorized or budgeted head count for the R&D

organization.

Q. And I think that's the same figure

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you gave for the hundred or so people in your present department, quality assurance and specification systems, I think you mentioned authorized numbers.

MR. MURPHY: Objection as to form.

But he was talking about a different department. He was using the same term.

MR. ROGERS: I believe that's the case.

Q. Is that correct?

A. Yes.

Q. Using that term, and turning back to the period of time during which you were in the research and development department, what do you recall, and let's use the latest date of 1989, say, what do you recall as the total authorized or budgeted head count for the R&D organization?

A. My recollection, and I'm not sure it's a 1989 recollection, but my recollection, and it's probably safe to say that it's a recollection of the time during which I was a director in R&D and would have had more insight into the breadth of R&D in those kind of administrative areas because they would have been

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perhaps discussed, was that the R&D population was at one time or another during that period somewhere in the vicinity of 600 people.

MR. MURPHY: Is that limited to professional staff or does it include technical staff?

THE WITNESS: No, that included -- that would have included technicians, administrative support personnel, secretarial support personnel. To the best of my knowledge, everyone who was, quote, on the R&D payroll.

There is -- we have all these strange anomalies -- there is an anomaly in that I believe that there was a portion of that population, while they were referred to as R&D employees, who might have actually been on a different payroll because of an interaction in support of international.

And so they might not necessarily show up on an R&D payroll. But at my level, I didn't distinguish between the difference in that.

(Knudson Exhibit 17 for identification, memo from M. Hausermann to Mark

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2 A. Serrano dated July 26, 1985.)

01:56:36 3 Q. You've just been handed what's been
01:56:38 4 marked as Knudson Exhibit 17, which is a one-page
01:56:42 5 document, a memo from M. Hausermann to Mark A.
01:56:48 6 Serrano dated July 26, 1985, subject, R&D
01:56:48 7 issues.

01:56:52 8 The production number is PB 110146.
01:56:52 9 The Philip Morris production number is
01:57:00 10 2031436272. And if you look at the names listed
01:57:04 11 towards the bottom of the page next to cc, your
01:57:06 12 name appears.

:57:08 13 Do you recall receiving a copy of
01:57:08 14 this document?

01:57:16 15 A. No, I don't have any recollection of
01:57:16 16 it.

01:57:20 17 Q. Who is M. Hausermann?

01:57:24 18 A. Dr. Max Hausermann was the vice
01:57:28 19 president of R&D at the time that this letter was
01:57:28 20 written.

01:57:32 21 Q. And what position did Mark Serrano
01:57:38 22 hold during the time this memo was written?

01:57:40 23 A. Mark Serrano was the senior or
01:57:44 24 executive vice president of operations. I
:57:50 25 believe that's the correct title. For Philip

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Morris U.S.A.

Q. Is that the same position that Steve Darrah held?

A. No. No, it's not.

Q. If you'll turn to item 3 on this exhibit, entitled "Product quality from Semi-Works," "Significant improvements were achieved particularly in the control of tar, nicotine, and menthol deliveries. Physical cigarette properties are improved also. Don Knudson wants to inform you about this because further improvement depends on the acquisition of some equipment in the make pack area."

Reading this paragraph, does that refresh your recollection about work performed at Semi-Works during this time period?

MR. MURPHY: Objection to form. I don't think you've asked him about that work. You can answer the question.

A. It refreshes my memory in a general sort of way as to the kinds of activity that might have been going on.

Q. Turning to the first sentence, "Significant improvements were achieved

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particularly in the control of tar, nicotine, and menthol deliveries."

What was your involvement in the work regarding control of tar and nicotine and menthol deliveries?

MR. MURPHY: Objection to form. You can answer the question.

A. At the time this memo was written was within a few months of my having assumed the position as director of process development. The position I had come from immediately prior to that was manager of the tobacco materials division.

The work being cited here relates to the Semi-Works operation, which was a different managership. So in all likelihood, my involvement in these activities, whatever they may have been, was minimal to nonexistent.

Q. The final sentence of this item, "Don Knudson wants to inform you about this because further improvement depends on the acquisition of some equipment in the make pack area."

Do you recall communicating with Mark Serrano with respect to either the projects

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02:00:42 2 listed in the first sentence, which is
02:00:44 3 significant improvements were achieved in the
02:00:48 4 control of tar, nicotine, menthol, or the second
02:00:50 5 sentence, physical cigarette properties?

02:00:52 6 MR. MURPHY: Objection to form. You
02:00:52 7 can answer.

02:01:02 8 A. My basic recollection would be that
02:01:06 9 one of the challenges facing the Semi-Works
02:01:12 10 operation, which is essentially a mini factory,
02:01:16 11 was to demonstrate its ability to produce
02:01:22 12 products for internal testing that were
:01:32 13 representative of products which if taken into
02:01:38 14 the commercial environment would perform
02:01:40 15 similarly, that is, the Semi-Works being a
02:01:42 16 good -- a representative test bed for generating
02:01:44 17 test product.

02:01:54 18 As such, the challenge was to achieve
02:02:00 19 similar or even greater degrees of control, i.e.
02:02:06 20 reduced variability, in the production of
02:02:10 21 products that were made in the Semi-Works for the
02:02:14 22 benefit of accurate testing.

02:02:28 23 Q. So are these process development
02:02:32 24 improvements that you're referring to?

:02:32 25 MR. MURPHY: Objection to form. You

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can answer.

A. As I've said before, the organization's responsibility was process development. Again, I don't recall specifically what the details of this work was. However, I would assume that it was process development work that resulted in a reduction in the variability exhibited by products coming out of the Semi-Works.

Q. Do you know who at Philip Morris was involved in the project to control tar, nicotine and menthol deliveries that's referenced in this document?

MR. MURPHY: Objection to form. You can answer the question.

A. I don't know who would have been involved in the project. I can say that to the best of my recollection, the manager of the Semi-Works at that point in time would have been Ken Burns.

Q. Do you know of any processes in Philip Morris's manufacture of cigarettes that are used to control nicotine?

MR. MURPHY: Objection to form. Is

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02:04:12 2 your question a question with respect to the
02:04:14 3 manufacture of cigarettes commercially sold in
02:04:16 4 the United States?

02:04:16 5 MR. ROGERS: Yes.

02:04:24 6 MR. MURPHY: If you understand the
02:04:24 7 question you can answer it.

8 A. Could you repeat it?

02:04:26 9 Q. Do you know of any processes in
02:04:28 10 Philip Morris's manufacture of cigarettes
02:04:28 11 commercially sold in the United States that are
02:04:30 12 used to control nicotine?

:04:32 13 MR. MURPHY: Objection to form. You
02:04:32 14 can answer.

02:04:36 15 A. No, I'm not aware of any processes to
02:04:40 16 control nicotine.

02:05:18 17 Q. You mentioned during your testimony
02:05:20 18 yesterday that you had involvement in the ART
02:05:26 19 project, which I take it to mean the alcohol --
02:05:30 20 I'm sorry, the alkaloid reduced tobacco project;
21 is that correct?

02:05:30 22 A. That's correct.

02:05:32 23 MR. MURPHY: As opposed to corporate
02:05:34 24 ART purchases.

:05:34 25 MR. ROGERS: Yes.

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02:05:36 2 A. Yes, that is correct.

02:05:42 3 Q. When did you first get involved in
02:05:42 4 the ART project?

02:05:56 5 A. To the best of my recollection, it
02:05:58 6 would have been sometime after I became the
02:06:00 7 director of process development, which would have
02:06:10 8 been basically mid-year, 1985, and how long after
02:06:18 9 that, I cannot accurately recall.

02:06:20 10 The other question that we get into
02:06:24 11 is what's -- at what point does an activity
02:06:28 12 become the ART project.

:06:34 13 Q. When did you first learn about a
02:06:40 14 consideration of the production of an alkaloid
02:06:42 15 reduced tobacco cigarette?

02:06:52 16 A. I'm not sure of the time frame, but I
02:06:56 17 believe that discussions of an alkaloid reduced
02:07:04 18 tobacco for use in a, quote, denicotinized
02:07:14 19 cigarette, had probably been around the R&D
02:07:18 20 center in a discussion phase earlier than that
02:07:22 21 1985 date that I gave you. And I'm not sure how
02:07:24 22 much earlier.

02:07:24 23 Q. Do you recall who asked you to
02:07:28 24 participate in the development of an alkaloid
:07:30 25 reduced tobacco cigarette?

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02:07:48 2 A. My recollection is that an interest
02:07:56 3 had developed in the utilization of supercritical
02:08:02 4 extraction technology with that -- with alkaloid
02:08:08 5 reduction being one of the areas of interest, and
02:08:14 6 that that was occurring in a time frame when
02:08:16 7 several things were happening, which is why I'm a
02:08:18 8 little bit vague on this.

02:08:20 9 One was the acquisition of General
02:08:24 10 Foods, and the other was the transition of Max
02:08:30 11 Hausermann's -- Dr. Hausermann's departure and
02:08:34 12 Dr. Houghton's replacement of Dr. Hausermann.

:08:38 13 So to say accurately whether one or
02:08:42 14 the other or both gave me that assignment, I
02:08:42 15 truthfully can't say.

02:08:50 16 Q. And your rough estimation of when you
02:08:52 17 received that assignment?

02:08:52 18 MR. MURPHY: Objection to form. You
02:08:52 19 can answer.

02:09:00 20 A. Accepting that it's a rough
02:09:02 21 estimation, we're talking about the time period
02:09:04 22 late '85, beginning of 1986.

02:09:08 23 Q. Why was Philip Morris considering the
02:09:10 24 development of a denicotinized cigarette?

:09:20 25 A. To the best of my recollection, there

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had been some consumer concept studies done which indicated that a low nicotine cigarette was something that the consumer might be interested in.

Q. Do you recall why consumers might have been interested in a low nicotine or denicotinized cigarette at this time?

A. No, I don't have any recollection of that.

Q. When did Philip Morris begin producing a denicotinized cigarette for sale in the United States?

MR. MURPHY: Objection to form. I just want to be precise about what the question is asking the witness to testify to. Are you asking when commercial production began for test marketing? Are you asking when the first test cigarettes were produced? I think that we just ought to define what the question is, because I think different time periods may be applicable.

MR. ROGERS: That's a fair point.

Q. Let me ask first when commercial production began for test marketing the De-Nic cigarette.

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02:11:34 2 MR. MURPHY: You can answer the
02:11:36 3 question.

02:11:42 4 A. Again, you'll have to accept some
02:11:48 5 rough time frames in terms of that answer. When
02:11:56 6 I moved from R&D to the Bermuda facility, which
02:12:00 7 was the commercial facility for producing the
02:12:08 8 denicotinized cut filler for that product, a
02:12:12 9 limited portion of the facility had in fact been
02:12:14 10 sufficiently started up that it was producing
02:12:20 11 poundage.

02:12:22 12 I do not recall whether or not that
:12:24 13 poundage had been converted into finished
02:12:28 14 products and in fact introduced into the
02:12:32 15 marketplace at that point in time, or whether it
02:12:36 16 was subsequent to that.

02:12:42 17 But order of -- again, trying to put
02:12:46 18 a range on it, it certainly would have been
02:12:52 19 sometime in the -- at earliest, second half of
02:12:56 20 1989, into the first part of 1990.

02:13:12 21 Q. Does Philip Morris today produce a
02:13:14 22 De-Nic cigarette for sale in the United States?

02:13:16 23 A. I don't believe so.

02:13:16 24 Q. Do you know when Philip Morris
:13:20 25 discontinued its production of a De-Nic cigarette

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for sale in the United States?

MR. MURPHY: Objection to form. You
can answer.

A. To the best of my recollection, when
I left the Bermuda facility in February of 1991,
at least some of the test markets were still
open, that is, product was still being sold in
the marketplace.

I cannot recall whether the product
being sold in the marketplace was being sold from
an inventory that had been produced prior to
that, or whether there was additional production
requirements post that time.

Q. Do you know why Philip Morris has
discontinued its production of a De-Nic cigarette
for sale in the United States?

A. It was my understanding that the sale
of that product was discontinued because it
didn't meet with a significant consumer
acceptance.

Q. Do you remember the negative
reactions of consumers to the De-Nic cigarette?

MR. MURPHY: Objection to form.
Misstates prior testimony. You can answer the

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question.

A. I'm not sure I know how to answer the question. The negative reaction to the product, I think that the issue was the product was in test market and was not being bought in significant quantity for those test markets to grow or even sustain themselves from certain levels.

Q. Mine was an inartful question. I apologize. I'm just simply trying to understand your knowledge as to why the cigarette didn't meet with consumer acceptance.

MR. MURPHY: Are you asking him whether he knows why the cigarette was not accepted in the test market?

MR. ROGERS: Yes.

MR. MURPHY: You can answer the question.

A. I don't think I know the answer to that question.

Q. Did you work with Cliff Lilly in the development of the the denicotinized cigarette?

A. I worked with Cliff Lilly in the development of the process for supercritically

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02:16:40 2 extracting tobacco to provide a denicotinized
02:16:42 3 filler.

02:16:44 4 Q. Would you describe to me how you came
02:16:48 5 upon developing the process of supercritically
02:16:50 6 extracting tobacco.

02:16:50 7 MR. MURPHY: Objection to form. The
02:16:54 8 witness hasn't claimed that he invented it. It's
02:16:58 9 a little colloquial, but you can answer the
02:16:58 10 question.

02:17:02 11 A. To the best of my recollection,
02:17:08 12 shortly after the acquisition of General Foods,
:17:18 13 there was an opportunity for the heads of various
02:17:22 14 departments within their, quote, research and
02:17:28 15 development structure and PM U.S.A.'s research
02:17:32 16 and development structure to get together to meet
02:17:36 17 each other, find out a little bit about what the
02:17:38 18 organizations were about, what technologies,
02:17:44 19 expertises, synergies might exist.

02:17:46 20 At that point in time Cliff and I
02:17:52 21 were both aware of the possibility that
02:17:58 22 supercritical CO2 might be an interesting route
02:18:00 23 that might have some technical feasibility to
02:18:06 24 extracting nicotine from tobacco.

:18:08 25 At that get-together, we had occasion

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to hear from Tom Fazzina from General Foods who was familiar with their activities in the utilization of supercritical technology to extract caffeine from coffee in their facility in Bremen, Germany. We subsequently jumped on that interaction and began discussing with him to expand our own knowledge of the process.

And that was really the kickoff point from which we moved forward.

Q. At that time General Foods was using a supercritical CO2 extraction process to extract caffeine from coffee; is that correct?

A. Yes.

Q. Would you describe that process, specific to the extraction of caffeine, as you understand it?

A. I think I can describe it at a very high kind of level, kind of block flow diagram. I don't recall the details of processing conditions and so forth.

But it was essentially one in which supercritical CO2 at a given set of conditions was circulated through coffee beans. The resultant caffeine-carrying CO2 was passed

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02:19:58 2 through a carbon bed, resulting in the deposition
02:20:04 3 of the caffeine in the carbon bed and subsequent
02:20:06 4 recirculation of the CO₂ around that loop to
02:20:14 5 achieve a level of decaffeination of the coffee
02:20:16 6 beans.

02:20:38 7 Q. Was caffeine the only component of
02:20:40 8 the coffee bean that was deposited on the carbon
02:20:42 9 bed that you've described?

02:20:48 10 A. I don't recall.

02:20:50 11 Q. And now turning to the supercritical
02:20:58 12 extraction process used at Bermuda Hundred, would
:21:00 13 you describe that process for me, as it was
02:21:00 14 used.

02:21:02 15 A. As it was used in the commercial
02:21:04 16 facility at Bermuda Hundred?

02:21:06 17 Q. Yes.

02:21:12 18 A. The essence of the process was again
02:21:18 19 as, if you will, a two-vessel process, one with
02:21:20 20 the material to be extracted, in this case
02:21:26 21 tobacco, one with an absorbant medium, in this
02:21:32 22 case stems. The CO₂ ^{was} ~~whose~~ circulated through the
02:21:34 23 tobacco, removing nicotine, and then subsequently
02:21:38 24 depositing that nicotine onto the stems and
:21:42 25 recirculating.

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02:21:46 2 Q. Was there any consideration given to
02:21:50 3 using carbon as the absorbant medium rather than
02:21:52 4 stems?

02:21:52 5 A. Yes, there was.

02:21:56 6 Q. And was there a determination made
02:22:00 7 that carbon would be an unacceptable absorbant
02:22:00 8 medium?

02:22:04 9 A. The determination was that the
02:22:08 10 product produced using carbon was subjectively
02:22:10 11 unacceptable.

02:22:14 12 Q. Do you recall why that was?

:22:18 13 A. I don't recall the details of what
02:22:22 14 was wrong with its subjectives except that it was
02:22:24 15 subjectively unacceptable.

02:22:26 16 Q. Was carbon the first absorbant medium
02:22:26 17 that was tested?

02:22:30 18 A. To the best of my recollection, yes.

02:22:34 19 Q. And were the stems the second
02:22:36 20 absorbant medium that was tested?

02:22:40 21 A. To the best of my recollection, there
02:22:48 22 were several other absorbant medias evaluated,
02:22:52 23 and here we're all talking about pilot scale,
02:22:54 24 obviously not in the commercial scale. There
:22:56 25 were several other absorbant medias evaluated

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before we got to stems.

Q. To your knowledge what were those other absorbant medias that were evaluated?

A. I'm not sure that I can enumerate all of them. The ones that I do recall was that we looked at utilizing cocoa shell. We looked at utilizing basically cotton. I believe we looked at utilizing a cellulose substraat, if I remember correctly, a material that's referred to as wetlap, which is a processed cellulose material.

Q. Do you recall why you concluded that stems were the best absorbant media of all those evaluated?

MR. MURPHY: Objection to form. Are you asking for the witness's conclusion or Philip Morris's conclusion?

MR. ROGERS: I apologize. I'm asking for Philip Morris's conclusion.

MR. MURPHY: You can answer the question.

A. I believe the conclusion that was reached was that the tobacco produced when stems were used as the absorbant was the most subjectively acceptable tobacco as compared to

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the other absorbant materials that had been
evaluated in their respective tobacco products.

Q. When you use the term "subjectively
acceptable," what do you mean by that?

A. The results of subjective experts
evaluating the product in cigarette form, and
making an assessment as to between, for instance,
multiple products produced with multiple
absorbant materials which were better. Again,
not being a subjective expert, I'm hard pressed
to define for you what goes into "better."

Q. So I make sure I understand your
testimony right, the subjectives of the De-Nic
filler exceeded the subjectives of the De-Nic --
of the De-Nic filler using stems exceeded the
subjectives of the De-Nic filler using the other
absorbant medias?

MR. MURPHY: Objection to form. You
can answer.

A. I think exceeding -- I'm not sure how
to fit that term in vis-a-vis the question of
subjectives.

I think that my understanding was
that an assessment process basically said that

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02:26:34 2 the subjectives of the filler resulting from the
02:26:38 3 process when stems were used as the absorbant
02:26:48 4 material was deemed to be better or -- and again,
02:26:54 5 I can't put a definition around "better" -- than
02:26:58 6 the filler -- and when I say "filler," it's that
02:27:00 7 filler produced into a cigarette form and smoked
02:27:04 8 and evaluated by a subjective panel or subjective
02:27:08 9 experts -- than filler produced in that form
02:27:14 10 that was from a different absorbant substraat.

02:27:24 11 Q. Where did Philip Morris obtain the
02:27:28 12 stems used as the absorbant media? Were they
:27:28 13 purchased?

02:27:28 14 MR. MURPHY: Objection to form.
02:27:32 15 Compound. You can answer the question.

02:27:36 16 A. In the purest sense, we purchase all
02:27:40 17 of our stems directly, indirectly, whatever, so
02:27:42 18 yes, they were purchased.

02:27:50 19 Q. Did the use of stems as an absorbant
02:27:54 20 medium in the De-Nic process decrease the supply
02:28:00 21 of Philip Morris's stems for use in other Philip
02:28:00 22 Morris products?

02:28:20 23 A. I don't know. That's one of those
02:28:24 24 questions that, from a pure logic point, would
:28:32 25 suggest that the answer would be yes. But

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02:28:34 2 without knowing whether or not one has
02:28:40 3 availability to or an excess of stems, I can't
02:28:40 4 really answer the question.

02:28:44 5 MR. MURPHY: Availability to what?

02:28:46 6 THE WITNESS: Availability to
02:28:48 7 additional stems or has an excess of stems that
02:28:50 8 are being stockpiled.

02:28:52 9 MR. MURPHY: I understand.

02:28:54 10 Q. Do you know prior to the De-Nic
02:28:58 11 project whether Philip Morris had excess supply
02:29:00 12 of stems?

:29:00 13 A. No, I don't.

02:29:12 14 Q. Does Philip Morris purchase stems
02:29:16 15 separate from the leaf that it purchases, so
02:29:20 16 stems as a singular item?

02:29:20 17 A. I don't know the answer to that
02:29:22 18 question.

02:29:26 19 Q. Do you recall any work that you were
02:29:30 20 involved in with respect to the ART project that
02:29:38 21 involved the treatment of the De-Nic filler with
02:29:40 22 acids?

02:29:48 23 A. I don't have any recollection of
02:29:48 24 that.

25

(Knudson Exhibit 18 for

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2 identification, memo from J. L. Charles and D. B.
3 Knudson to Dr. K. S. Houghton dated December
4 16th, 1987.)

02:30:30 5 Q. You've just been handed what's been
02:30:32 6 marked as Knudson Exhibit 18, which is a one-page
02:30:36 7 memo from J. L. Charles and D. B. Knudson to
02:30:40 8 Dr. K. S. Houghton dated December 16th, 1987,
02:30:46 9 subject matter, Project ART, dash, status of
02:30:48 10 nicotine in filler and smoke.

02:30:52 11 The production number is PB 111028.
02:30:52 12 The Philip Morris production number is
 :30:58 13 2031437176.

02:31:02 14 Do you recall writing this memo to
02:31:04 15 Dr. Houghton?

02:31:12 16 A. I certainly didn't recall it prior to
02:31:18 17 seeing it. Having now seen the memo, I still
02:31:20 18 don't have any recollection of having written
02:31:24 19 it. It is my signature at the bottom.

02:31:28 20 Q. If I can direct your attention to
02:31:32 21 item 3, and I'll read it, "Addition of either 2
02:31:38 22 percent lactic, citric, malonic or levulinic acid
02:31:40 23 to extracted full flavor blend did not result in
02:31:42 24 a further reduction of nicotine in mainstream
 :31:46 25 smoke. Subjective evaluation of these cigarettes

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02:31:48 2 with added acid were acceptable and may be useful
02:31:50 3 for modifying subjective responses in model
02:31:54 4 cigarettes with high ammonia levels and filler.
02:31:58 5 Addition of 8 milligrams of citric acid to the
02:32:00 6 filter of a cigarette containing 2 percent citric
02:32:02 7 acid did not result in a further reduction of
02:32:06 8 nicotine in mainstream smoke."

02:32:08 9 Reading that paragraph, does that
02:32:10 10 refresh your recollection about your involvement
02:32:16 11 in the addition of acids to extracted full flavor
02:32:16 12 blend?

:32:26 13 A. No, actually reading that paragraph
02:32:28 14 still doesn't refresh my memory.

02:32:34 15 Q. Knowing what you do about the ART
02:32:36 16 project, why do you think tests were conducted on
02:32:40 17 adding acid to blend?

02:32:44 18 A. Well, reading the rest of the memo
02:32:48 19 refreshes my memory that we had an interesting
02:32:52 20 anomaly that occurred in that one would expect
02:33:02 21 that if one removes 97 percent of the nicotine
02:33:06 22 from the filler, that one might expect a 97
02:33:08 23 percent reduction in the resultant nicotine smoke
02:33:10 24 delivery.

:33:14 25 As noted in here, and something that

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I had truthfully forgotten all about until I reviewed this document that's placed in front of me, this anomaly occurred in which some portion -- something was amiss, because the reduction in smoke was only on the order of 92 percent.

The question that that raises is, is there something about the constituency of nicotine in tobacco that makes some portion of it undetectable, so that instead of removing 97 percent of the nicotine in the tobacco, you're only removing 97 percent of the, quote, detectable nicotine, and yet that nondetectable becomes available in the smoke?

Again, the details of this particular piece of work in using acids, I really don't recall the thrust or significance of the work. It appears to be an effort to try and bring the smoke delivery into closer compliance to the effective reduction that was achieved in the process.

Q. In the second sentence of that item 3, there's a reference to model cigarettes with high ammonia levels in filler. Did the De-Nic

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02:35:00 2 filler have what you would consider a high
02:35:02 3 ammonia level?

02:35:04 4 MR. MURPHY: Objection to form. You
02:35:04 5 can answer.

02:35:14 6 A. Again, even though I wrote this memo
02:35:16 7 or was at least a coauthor to this memo, I
02:35:22 8 think -- and I'm not sure what a high ammonia
02:35:26 9 level in filler means or what it was intended to
02:35:36 10 mean in this statement here, so I don't know that
02:35:38 11 I can answer the question.

02:35:48 12 Q. At any point during the development
:35:52 13 and implementation of the De-Nic process at
02:35:54 14 Bermuda Hundred, did Philip Morris treat the
02:36:00 15 stems that were used as an absorbant medium with
02:36:02 16 citric acid?

02:36:04 17 A. To the best of my recollection, they
02:36:04 18 did.

02:36:08 19 Q. Do you recall why the citric acid was
02:36:12 20 added to the -- what I'll call absorbant stems?

02:36:14 21 A. To the best of my recollection, it
02:36:22 22 made the stems more efficient in their ability to
02:36:30 23 scrub nicotine out of the CO2 stream, that is,
02:36:34 24 they contributed to the efficiency of the overall
:36:38 25 extraction process, and hence the number of

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recirculations, and as a result the time required to achieve an extraction of a given level.

Q. Would it be correct to say therefore that the citric acid enhanced the absorbant capacity of the stems?

MR. MURPHY: Objection to form. You can answer.

A. I don't know that it increased the absorbant capacity of the stems so much as it played a role in terms of the rates in the process, meaning that the stem was able to, for the same contact period, was able to absorb the nicotine and the CO2 stream more rapidly.

Q. Do you know what MPC is?

A. In the context of the ART process, my recollection says MPC was monopotassium citrate.

Q. And was MPC added to the stems that were used as an absorbant medium?

A. I do not have any recollection of MPC being used in the commercial process, which is not to say that it wasn't at some point in time.

My recollection is MPC was one of a number of things that were looked at in an effort to achieve what I'll call acceleration of the

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02:38:42 2 process. Given the complexity of the equipment
02:38:48 3 required to run a supercritical process, the cost
02:38:52 4 efficiency of the process was going to be very
02:38:56 5 much influenced by the rates at which one could
02:38:58 6 accomplish things within the process.

02:39:08 7 Q. Turning back to Knudson Exhibit 18,
02:39:16 8 do you know whether Philip Morris has ever added
02:39:18 9 lactic acid to cigarettes made for commercial
02:39:20 10 production, De-Nic cigarettes or any other
02:39:24 11 cigarettes, for sale in the United States?

02:39:26 12 A. I don't have any awareness of that.

:39:30 13 Q. Do you know whether Philip Morris has
02:39:32 14 ever added citric acid to any of its domestic
02:39:34 15 brands?

02:39:34 16 A. I don't have any awareness of that.

02:39:36 17 Q. Do you know whether Philip Morris has
02:39:42 18 ever added malonic acid to any of its domestic
02:39:42 19 brands?

02:39:44 20 A. I don't have any awareness of that.

02:39:46 21 Q. Do you know whether Philip Morris has
02:39:50 22 ever added levulinic acid to any of its domestic
02:39:50 23 brands?

02:39:52 24 A. I don't have any awareness of that.

:39:56 25 Q. Do you know whether the addition of

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02:40:00 2 acids to filler has any effect on nicotine
02:40:02 3 delivery?

02:40:06 4 MR. MURPHY: Objection to form. You
02:40:06 5 can answer.

02:40:12 6 A. No, I'm not familiar with the role
02:40:14 7 that some of those chemistries might play.

02:40:32 8 Q. Do you recall in conjunction with the
02:40:38 9 ART process a test to determine if aging ART
02:40:44 10 cigarettes changed the level of extractable
02:40:44 11 nicotine?

02:40:50 12 MR. MURPHY: Objection to form. You
:40:52 13 can answer the question.

02:40:58 14 A. I guess I'm really puzzling over the
02:41:06 15 question. If aging ART cigarettes -- would you
02:41:08 16 repeat the last part of the question?

02:41:08 17 Q. Sure. If aging ART cigarettes
02:41:16 18 changed the level of extractable nicotine.

02:41:16 19 MR. MURPHY: I continue to object to
02:41:20 20 the form of the question. If you understand what
02:41:22 21 you're being asked, you can answer.

02:41:24 22 A. The easy answer is to say I don't
02:41:28 23 have any recollection of it. But I think it's a
02:41:30 24 misstatement of whatever it is you're trying to
:41:36 25 ask. Aging of ART cigarettes would be post their

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extraction. So I don't understand the
significance of the question.

Q. Why don't I show you a document and
then we'll pursue this further.

(Knudson Exhibit 19 for
identification, document describing the effects
of aging of ART cigarettes on extractable
nicotine and delivery of nicotine in smoke, dated
27 April 1989.)

Q. You've just been handed what's been
marked as Knudson Exhibit 19, which appears to be
a document describing the effects of aging of ART
cigarettes on extractable nicotine and delivery
of nicotine in smoke, dated 27 April 1989. And
if you'll turn to the distribution list on the
final page, you'll see your name roughly halfway
down the list.

The production numbers are PB 111508
to PB 111512. Philip Morris production numbers
are 2031437657 to 2031437661. I'll just read the
purpose as it's written on this document.

"To determine if changes in the
amount of extractable nicotine (EN) delivery of
nicotine in mainstream smoke or both occur when

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02:43:02 2 ART cigarettes experience accelerated aging under
02:43:04 3 selected conditions."

02:43:04 4 Do you recall receiving this
02:43:06 5 document?

02:43:08 6 A. No, I don't have any recollection of
02:43:10 7 it.

02:43:12 8 Q. Do you recall ever reading this
02:43:12 9 document before?

02:43:16 10 A. No, I don't have a recollection of
02:43:16 11 it.

02:43:22 12 Q. Does the description of the project
:43:26 13 in the "Purpose" section of this document refresh
02:43:28 14 your recollection as to any tests conducted on
02:43:32 15 the effects of aging of ART cigarettes on
02:43:34 16 extractable nicotine?

02:43:44 17 A. No, it really doesn't.
02:43:48 18 Unfortunately, it's the kind of document that I
02:43:54 19 suspect was written by somebody that -- without
02:43:58 20 reading the entire document, I might not be able
02:44:00 21 to understand exactly what it was that they were
02:44:00 22 going after.

02:44:04 23 Q. On April 27th, 1989, were you the
02:44:06 24 plant manager of Bermuda Hundred?

:44:10 25 A. No. In April of 1989 I still would

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have been the director of process development. I would like to think this was not a document written by somebody in process development. It doesn't look like an engineering sort of presentation. It's a little bit more convoluted in the way it reads.

MR. MURPHY: Are you asking him to read the document carefully?

Q. No, I was simply asking if just looking at it, and specifically the purpose of the test, refreshed your recollection as to whether aging of ART cigarettes has any effect on extractable nicotine.

A. You understand my quandary is that the extraction of nicotine in the context of what we've been talking about would be a measure taken on the tobacco product exiting an extractor, which is well before it ever gets made into a cigarette form.

So how anything one could do to a cigarette could be equated to a change in the extractability that occurred back prior to -- at a prior step in the process is just a total disconnect for me as I'm sitting here reading

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this.

MR. MURPHY: We are now about as far
afield from the ABC broadcast as one can go. How
much have we got left, Alex?

MR. ROGERS: On the effects of aging
ART cigarettes? I don't anticipate we have much
at all.

MR. MURPHY: How about with this
deposition?

MR. ROGERS: Yes, I think we have
other topics that are part of the ART project, of
which Mr. Knudson was a member.

MR. MURPHY: Okay.

(Knudson Exhibit 20 for
identification, Richmond processing plants,
manufacturing plan, 1990 to 1995.)

Q. You've just been handed what's been
marked Knudson Exhibit 20, which is a document,
the first page of which says "Richmond processing
plants, manufacturing plan, 1990 to 1995."

The production numbers are PA 802863
to PA 803044. Philip Morris number is ~~2030878610~~²⁰³⁰⁸⁷⁸⁶¹⁰
to 2030878791. I think it's unnecessary to look
at the whole document. I'm going to ask you

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02:47:14 2 about a section specifically, and I'll refer you
02:47:16 3 to that section.

02:47:18 4 Just to familiarize yourself with the
02:47:20 5 document, if you turn to page 3, which is PA
02:47:26 6 802865, you'll see a table of contents for this
02:47:32 7 document. Item number 1 is overview, item number
02:47:36 8 2, processing plans, item 3, contract processors,
02:47:38 9 and item 4, processing plan issues.

02:47:38 10 Have you ever seen this document
02:47:40 11 before?

02:47:42 12 A. I don't recall it.

:47:48 13 Q. I would like to direct your attention
02:47:52 14 to the section on Bermuda Hundred which
02:47:56 15 ^{begins}
~~against~~ -- I think the easiest way to do it would
02:48:00 16 be our production number of PA 802944.

02:48:22 17 If you'll look at this, it appears to
02:48:24 18 be a description of the ART process as we've been
02:48:30 19 talking about it today. I want to focus your
02:48:32 20 attention on the first two paragraphs.

02:48:34 21 "The mission of the Bermuda Hundred
02:48:36 22 processing facility is to produce cut filler with
02:48:40 23 less than point 10 percent residual nicotine for
02:48:42 24 cigarette manufacturing to support a new brand
:48:44 25 introduction and the creation of a new market.

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02:48:46 2 Bermuda Hundred is designed to have a capacity to
02:48:48 3 support the production of 12 billion cigarettes
02:48:50 4 based on a seven day a week operation of
02:48:52 5 approximately two market share points.

02:48:56 6 "The technology for this process is
02:48:58 7 new to the cigarette industry but had been
02:49:00 8 utilized in the manufacturing of decaffeinated
02:49:04 9 coffee at Cafe Hag in Germany, and most
02:49:08 10 recently, General Foods in Houston. At Bermuda
02:49:10 11 Hundred, strip will be blended and cut, nicotine
02:49:12 12 will be extracted from cut strip and deposited on
:49:14 13 stems.

02:49:14 14 "A major commitment for the next five
02:49:16 15 years will be adaptation of the process
02:49:20 16 enhancements developed ^{by} ~~in~~ Bermuda Hundred and
02:49:20 17 R&D."

02:49:22 18 Is that an accurate description of
02:49:24 19 the ART process as you understand it?

02:49:24 20 MR. MURPHY: Objection to form. You
02:49:26 21 can answer the question.

02:49:32 22 A. It's not much of a description of the
02:49:36 23 process. It's a very top line picture as might
02:49:38 24 be written in this kind of document.

:49:42 25 Q. I want to direct your attention next

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02:49:48 2 to PA 803040, which is very close to the back of
02:49:50 3 this document.

02:49:50 4 A. I'm sorry. Could you give me that
02:49:52 5 number again?

02:50:26 6 Q. Sure. 803040. On the top of this
02:50:28 7 page is the title, "Bermuda operation,"
02:50:30 8 "Objective, assure that Bermuda Hundred plant is
02:50:32 9 positioned to meet demand for new and improved
02:50:34 10 cigarette brands."

02:50:36 11 And then the issue, "Domestic market
02:50:38 12 demand may fail to fully utilize capacity of the
:50:42 13 Bermuda facility. MC DIET operation may
02:50:46 14 contaminate Bermuda filler and alternative stem
02:50:48 15 utilization must be evaluated to minimize cost."

02:50:50 16 What do you understand the term "MC
02:50:52 17 DIET operation" to mean?

02:50:54 18 MR. MURPHY: Objection to form. You
02:50:56 19 can answer.

02:51:00 20 A. The MC DIET operation terminology
02:51:08 21 refers to the DIET process that exists and
02:51:10 22 existed at this time at the MCR manufacturing
02:51:12 23 center in Richmond.

02:51:14 24 Q. Are you familiar with any concerns
:51:18 25 about how that operation may, quote, contaminate

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02:51:20 2 Bermuda filler?

02:51:32 3 A. I guess I have some vague -- very
02:51:36 4 vague recollections as to what that statement
02:51:42 5 might mean. Is it possible that if I were to
02:51:48 6 take a moment and read the rest of this, that it
02:51:48 7 might refresh my memory?

02:51:48 8 Q. Feel free.

02:51:50 9 (Witness complies.)

02:52:02 10 A. Unfortunately the reference simply
02:52:04 11 says -- puts my name beside it and gives me a
02:52:06 12 time frame to do something about it, and doesn't
:52:08 13 provide any refreshing thought.

02:52:44 14 MR. MURPHY: Is there a question
02:52:44 15 pending?

02:52:46 16 MR. ROGERS: Yes.

02:52:46 17 Q. Are you familiar with any concerns
02:52:50 18 about how the MC DIET operation may, quote,
02:52:54 19 contaminate Bermuda filler?

02:52:56 20 A. To the best of my recollection, one
02:53:02 21 of the considerations was whether or not some
02:53:10 22 portion of this denicotinized product could or
02:53:14 23 would be processed through the MC DIET operation
02:53:16 24 to allow the opportunity to use an expanded
:53:22 25 product, one of many potential propositions, if

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you will.

And consistent with that, there was a concern that in carrying out that processing, one would have to be aware of the potential to take a, quote, 97 percent denicotinized product and contaminate it either by inadvertently picking up some nondenicotinized product in the equipment along the way, or whether or not there was any possibility that there might be residual nicotine in the CO2 that's used in the DIET process that might, if you will, reverse deposit back onto the product.

That's a very sketchy set of recollections, and I'm not sure how accurate those are.

Q. If you'll turn the page to PA 803041, you'll see on the top of the page the subheading, "Stem utilization," and there are three items. "Evaluate best utilization of absorber stems and reconstituted tobacco (D. Knudson, fourth quarter, 1990)."

Item number 2, "Evaluate batching systems with reduced stem to tobacco ratios (D. Knudson, fourth quarter, 1990)." And finally,

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02:54:52 2 "Evaluate water column as an alternative
02:54:58 3 extraction method (RND ongoing)." I want to ask
02:55:00 4 you about item number 1.

02:55:04 5 Were you in charge, fourth quarter of
02:55:10 6 1990 or prior to that time, with overseeing plans
02:55:14 7 to utilize absorber stems in reconstituted
02:55:14 8 tobacco?

02:55:14 9 MR. MURPHY: Objection to form. You
02:55:16 10 can answer.

02:55:22 11 A. To the best of my recollection, my
02:55:28 12 responsibility as the plant manager was to be
:55:34 13 aware of work that might need to be done, and to
02:55:40 14 support from the factory perspective work that
02:55:40 15 might ~~need to be~~ done in order to answer
02:55:42 16 processing questions such as this.

02:55:46 17 Q. I take it the reference here to
02:55:50 18 absorber stems is after the stems have been used
02:55:56 19 as the absorbant medium for the nicotine; is that
20 correct?

02:56:04 21 A. I really don't have a basis for
02:56:10 22 drawing a conclusion one way or the other.

02:56:12 23 Q. Do you know whether stems used as th
02:56:16 24 absorbant medium in the ART process were ever
:56:20 25 used in reconstituted tobacco for commercial

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02:56:24 2 production after those stems served as the
02:56:28 3 absorbant medium in the ART process?

02:56:28 4 A. No, I don't.

02:56:34 5 Q. You don't know one way or the other?

02:56:34 6 A. No.

02:56:40 7 Q. Do you know whether those stems were
02:56:44 8 used in BL for commercial production?

02:56:44 9 A. No, I don't.

02:56:48 10 Q. Do you know whether those stems were
02:56:54 11 used in expanded stem used in cigarettes sold
02:56:58 12 domestically?

:56:58 13 MR. MURPHY: Objection. Asked and
02:57:02 14 answered. You can answer again.

02:57:02 15 A. No, I don't.

02:57:28 16 MR. MURPHY: Are we at a convenient
02:57:30 17 breaking point or are we in striking distance --

02:57:32 18 MR. ROGERS: I think we're in
02:57:34 19 striking distance. I prefer to go on, unless
02:57:36 20 there's strong objection otherwise, just to
02:57:38 21 facilitate the end of the deposition.

02:57:40 22 MR. MURPHY: Do you want to take a
02:57:42 23 short break, or -- shorter than the usual break?

02:57:46 24 THE WITNESS: Yes, if we could take a
:57:46 25 quick stretch break.

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02:57:46 2 MR. ROGERS: Absolutely.

02:57:48 3 THE VIDEO OPERATOR: We're going off
02:57:52 4 the record. The time on the screen is 2:57:50.

02:57:52 5 (A recess was taken.)

03:05:32 6 THE VIDEO OPERATOR: This is
03:05:36 7 videotape number 6, the continuation of the
03:05:40 8 deposition of Mr. Knudson. Today is July 13th,
03:05:44 9 1995, and the time on the screen is 3:05:45.
03:05:46 10 You're on the record.

03:05:48 11 Q. When we broke, Mr. Knudson, I was
03:05:52 12 asking you a few questions about Knudson Exhibit
:05:58 13 20, and the reference there to your name and the
03:06:00 14 project to evaluate the best utilization of
03:06:02 15 absorber stems and reconstituted tobacco.

03:06:08 16 And I asked you whether you were in
03:06:12 17 charge at this time with overseeing plans to
03:06:16 18 utilize absorber stems in reconstituted tobacco.

03:06:18 19 Your answer, and I'll quote, was, "To
03:06:18 20 the best of my recollection my responsibilities
03:06:22 21 as a plant manager was to be aware of work that
03:06:24 22 might need to be done and to support from the
03:06:28 23 factory's perspective work that might need to be
03:06:30 24 done in order to answer processing questions such
:06:30 25 as this."

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03:06:34 2 Do you recall any work that you
03:06:40 3 performed while plant manager of Bermuda Hundred
03:06:42 4 that was done to support the utilization of
03:06:44 5 absorber stems in reconstituted tobacco?

03:06:46 6 MR. MURPHY: Objection to form. You
03:06:46 7 can answer.

03:06:48 8 A. No, I don't have any recollection.

03:06:50 9 Q. Do you have any recollection of any
03:06:54 10 work that someone in your staff at Bermuda
03:06:56 11 Hundred might have done?

03:06:56 12 MR. MURPHY: Objection to form. Your
:07:00 13 question, although you quote the testimony
03:07:04 14 accurately, I think misstates or misconcludes the
03:07:06 15 testimony. But you can answer the question if
03:07:08 16 you understand what you're being asked.

03:07:12 17 A. It may not be the question being
03:07:16 18 asked, but I would have expected that somebody on
03:07:22 19 my staff was probably responsible for providing
03:07:26 20 representative samples of products that somebody
03:07:32 21 might have needed for testing or evaluation.

03:07:34 22 Q. Did you have any discussions with
03:07:36 23 anyone at Philip Morris about the utilization of
03:07:38 24 absorber stems in reconstituted tobacco?

:07:42 25 A. I don't have any recollection of

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that.

(Knudson Exhibit 21 for identification, memo from A. C. Lilly to distribution dated August 10th, 1989.)

Q. You've just been handed what's been marked Knudson Exhibit 21, a memo from A. C. Lilly to distribution dated August 10th, 1989. You'll see your name appears on the distribution list.

The production numbers are PB 203559 to PB 203572. The Philip Morris numbers are 2031437787 to 2031437800. And if I could direct your attention to page 4, which is PB 203562, there's a description of Project ART.

Do you see that page?

A. Yes, I do.

Q. And if I could just ask you to read that page to yourself, and then I'm going to ask you a question about it, and I'll alert you at the outset that there is a reference to your name in the final paragraph of this page.

(Witness complies.)

A. Okay.

Q. The first page of this document

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03:13:56 2 indicates that these are minutes of a June 28 to
03:14:04 3 29, 1989 planning meeting. Do you recall
03:14:06 4 attending a planning meeting on June 28 to 29 --

03:14:10 5 MR. MURPHY: Objection to form.

03:14:12 6 Q. -- 1989?

03:14:12 7 MR. MURPHY: Objection to form. You
03:14:12 8 can answer.

03:14:14 9 A. I don't have any clear recollection
03:14:16 10 of having attended this meeting.

03:14:18 11 Q. In reading this page that I've
03:14:24 12 directed your attention to, PB 203562, does that
:14:28 13 refresh your recollection about the project to
03:14:32 14 explore the utilization of absorber stems in
03:14:36 15 reconstituted tobacco?

03:14:50 16 A. No, I don't think this does anything
03:14:54 17 to refresh my memory. It implies that a number
03:15:00 18 of different considerations were being made to
03:15:02 19 what would be done with the ART stems.

03:15:10 20 Q. Do you ^{remember} ~~recall~~ the quantity of ART
03:15:14 21 stems that were generated at the Bermuda Hundred
03:15:16 22 plant, just a rough estimate?

03:15:18 23 MR. MURPHY: Objection to form. You
03:15:18 24 can answer.

:15:22 25 A. No, I really don't have any

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03:15:24 2 recollection as to what the quantity of stems
03:15:24 3 generated was.

03:16:10 4 Q. I asked you earlier whether you had
03:16:12 5 recalled any discussions with anyone at Philip
03:16:16 6 Morris about the utilization of absorber stems in
03:16:18 7 reconstituted tobacco. Your answer was, "I don't
03:16:20 8 have any recollection of that." Do you have any
03:16:20 9 recollection of any discussions about
03:16:26 10 considerations about using absorber stems in
03:16:26 11 reconstituted tobacco?

03:16:28 12 MR. MURPHY: Objection to form. You
:16:28 13 can answer.

03:16:34 14 A. I think the recollection that I have
03:16:42 15 is that discussions probably did occur, that I
03:16:44 16 would have been part of, that would have explored
03:16:48 17 a whole range of possibilities for utilization of
03:16:50 18 ART stems.

03:16:52 19 Q. And do you remember one of those
03:16:54 20 possibilities to be the use of ART stems in
03:16:56 21 reconstituted tobacco?

03:17:00 22 A. I don't specifically recall that.

03:17:14 23 Q. What happened to the absorber stems
03:17:16 24 that were used at Bermuda Hundred?

:17:18 25 A. I do not know.

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03:17:24 Q. What did you do with them at Bermuda
03:17:26 Hundred once they were used as the absorbant
03:17:30 medium for the De-Nic process?

03:17:34 A. They were packed out and placed in a
03:17:34 warehouse.

03:17:38 Q. Do you recall where that warehouse
03:17:38 is?

03:17:40 A. No, I don't. It was a warehouse
03:17:40 within the Richmond area.

03:17:44 Q. Do you know who was in charge of
03:17:48 packing out the stems and placing them in the
:17:48 warehouse?

03:17:52 A. It would have been some people within
03:17:56 the Bermuda Hundred facility. But I don't recall
03:17:58 specifically who was responsible for that.

03:18:34 Q. You've just been handed Knudson
03:18:36 Exhibit 22, which is a one-page memorandum from
03:18:40 H. Spielberg to J. E. Bickett dated September
03:18:46 28th, 1989, subject, utilization of MPC treated
03:18:50 stem from Bermuda Hundred in RCB.

22 (Knudson Exhibit 22 for
23 identification, one-page memorandum from H.
24 Spielberg to J. E. Bickett dated September 28th,
25 1989.)

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03:18:52 2 Q. The production number for Philip
03:18:58 3 Morris is 2031477543. I don't see a production
03:19:02 4 number for defendants. And I'll represent to
03:19:06 5 counsel I'll look into whether such a production
03:19:08 6 number exists, and if not, I will at a later
03:19:10 7 point identify the production number that's given
03:19:12 8 to this document.

03:19:14 9 MR. MURPHY: That's fine. It's not
03:19:14 10 actually a production number. It's your own
03:19:20 11 internal reference number. So I'm perfectly
03:19:20 12 satisfied with the Philip Morris production
:19:22 13 number, if this is an accurate copy of it.

03:19:22 14 MR. ROGERS: I appreciate that.

03:19:26 15 Q. It's a very short -- but first let me
03:19:30 16 direct your attention to the names. Listed next
03:19:34 17 to cc, your name appears as the third name.

03:19:38 18 MR. KILLORY: Just to clarify the
03:19:40 19 record before you ask a question, I believe,
03:19:42 20 subject to correction, that this is part of a
03:19:44 21 production we received right before the Cook
03:19:48 22 deposition, with some Cook documents. So we have
03:19:50 23 not had an opportunity to process it. ^{through receiving} That's why
03:19:56 24 it doesn't bear a PA or PB Bates stamp.

:19:58 25 Q. I'll just read the memo to you

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03:20:00 2 quickly, Mr. Knudson. "It is recommended that
03:20:08 3 art stems (VST DL and VSTB-1) be substituted for
03:20:10 4 up to 3 percent burley stem in RCB based on
03:20:14 5 subjective evaluations of RCB production trials.
03:20:16 6 Would you please issue the appropriate
03:20:20 7 specifications." And then there's a signature
03:20:24 8 and a signature line for H. L. Spielberg.

03:20:26 9 Do you recall receiving a copy of
03:20:28 10 this document?

03:20:28 11 A. No, I don't have any recollection of
03:20:28 12 that.

:20:32 13 Q. And reading this document today, does
03:20:36 14 that refresh your recollection as to whether or
03:20:40 15 not ART stems were used in reconstituted
03:20:40 16 tobacco?

03:20:44 17 MR. MURPHY: Objection to form. You
03:20:44 18 can answer.

03:20:46 19 A. No, it doesn't.

03:21:02 20 Q. What do you understand the final
03:21:04 21 sentence of this memorandum to mean? "Would you
03:21:08 22 please issue the appropriate specifications." Is
03:21:12 23 that the final stage prior to the specification
03:21:14 24 change?

:21:16 25 MR. MURPHY: Objection to form. You

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03:21:18 2 can answer.

03:21:22 3 A. I don't know whether that would
03:21:26 4 constitute the final stage or not.

03:21:30 5 Q. At what stage in the development of a
03:21:38 6 new process or product function are
03:21:40 7 specifications issued?

03:21:44 8 MR. MURPHY: Objection to form.
03:21:46 9 Vague and ambiguous. You can answer the
03:21:46 10 question.

03:21:48 11 A. Could you repeat question, please?

03:21:50 12 Q. Sure. At what stage in the
:21:52 13 development of a new process or product function
03:21:56 14 are specifications issued?

03:21:58 15 MR. MURPHY: Same objection. You can
03:21:58 16 answer.

03:22:10 17 A. I think there's not one
03:22:12 18 straightforward answer to that question. When it
03:22:20 19 comes to a process, there are -- there may well
03:22:24 20 be preliminary specifications that are developed
03:22:26 21 at some point in time.

03:22:28 22 There may be specifications that are
03:22:36 23 attributable to a test environment. So you would
03:22:40 24 have potential to have several different kinds of
:22:42 25 specifications relative to process that might be

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03:22:44 2 generated at different points in time.

03:22:50 3 Q. At this time of September 22nd, 1989,
03:22:52 4 what was Mr. Spielberg's position?

03:22:58 5 A. I do not recall except to say that
03:23:00 6 it's my recollection that he worked in R&D.

03:23:02 7 Q. Is he still employed by Philip
03:23:02 8 Morris?

03:23:06 9 A. No, I believe he's retired.

03:23:20 10 Q. Do you know what POL testing is?

03:23:28 11 A. POL, one utilization of that term
03:23:32 12 that I'm aware of is a reference to public
:23:42 13 opinion laboratory testing, which is the acronym
03:23:48 14 used for a form of mailout testing that's done of
03:23:52 15 sampler experimental product.

03:24:00 16 Q. In terms of the evaluation of a new
03:24:06 17 product, does the POL testing to which you've
03:24:18 18 just referred -- strike that.

03:24:20 19 In terms of the evaluation of a new
03:24:24 20 product, at what stage in that evaluation is POL
03:24:26 21 testing conducted?

03:24:30 22 MR. MURPHY: Objection to form. You
03:24:30 23 can answer the question.

03:24:36 24 A. Having never worked in the product
:24:40 25 development area, I don't know that I can

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accurately answer that question.

Q. Are you familiar with any other panel testing that's conducted prior to the introduction of a new product for commercial sale?

MR. MURPHY: Objection to form. You can answer.

A. To the best of my knowledge, there are any number of internal panel structures that may or may not be used in evaluation of products.

Q. I'm asking you a hypothetical question here. If a new product has passed all POL and panel testing, what other stages remain before its introduction for commercial sale?

MR. MURPHY: Objection to form. You can answer.

A. Again, not having worked in product development and without looking at a specific example, I'm not sure I could define how many stages are involved to get from there to the point where one might in fact take a product into production, into a commercial environment.

Q. Who at Philip Morris determined that

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the De-Nic cigarette should be taken off the domestic market for commercial sale?

MR. MURPHY: Objection to form. You can answer.

A. I don't know who made that final decision.

Q. Do you know at what level of the company that decision would be made?

A. No, I don't.

(Knudson Exhibit 23 for identification, memorandum from H. Grubbs and R. Prasad to Mr. D. M. Knudson, dated April 24, 1987.)

Q. You've just been handed what's been marked Knudson Exhibit 23, which is a memorandum from H. Grubbs and R. Prasad to ^{Mr. D. B.} ~~Mr. D. M.~~ Knudson, dated April 24, 1987, subject matter, efficient washing of stems. The Philip Morris production numbers are 2031437004 to 2031437006. Defendants' processing numbers are PB 110857 to PB 110859.

Do you recall receiving this memo from H. Grubbs and R. Prasad?

A. No, I don't have any recollection of

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it. I'll read the first two paragraphs and then ask you a question:

Q. "Project ART requires that the bright stems be washed in an efficient way in order to reduce the background nicotine level to under point 1 percent DWB. Currently the Bower Digester requires four passes to achieve target nicotine level in the stem. The wash liquor is too dilute to be of any use and it is presently discarded.

"It's proposed to wash stems in an efficient manner using a pulse column extractor. An atmospheric pulse column operating at elevated temperatures (50 degrees Celsius to 90 degrees Celsius) is capable of effecting complete nicotine removal at a significantly reduced 'water to stem' ratio.

"The resulting wash liquor concentration will be high enough to allow the soluble solids to be used in the sheet making operation."

Do you recall any work in regard to Project ART that involved the washing of stems?

A. Yes, I do.

Q. Did that washing occur prior to the

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use of the stems as the absorbant medium?

A. What's outlined here refreshes my memory that at one point in time, again, in an effort to improve the efficiency of the process, that we looked at using washed stems as the absorber medium.

Q. What was the reason for washing the stems?

A. Again, as I said, it was to try and improve the efficiency of the process.

Q. And turning your attention to the final sentence of the second paragraph that I read you, "The resulting wash liquor concentration will be high enough to allow the soluble solids to be used in sheet making operation."

Do you know what that's referring to?

A. Only to the extent that I could infer what that might mean from reading this sentence.

Q. What do you understand it to mean?

A. It simply raises the possibility that there will be a liquor stream containing tobacco solubles that could be utilized.

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03:30:56 2 Q. Was such a liquor stream containing
03:30:58 3 tobacco solubles utilized in sheet making
03:31:00 4 operation?

03:31:00 5 MR. MURPHY: Objection. Lack of
03:31:04 6 foundation. There's no testimony that this
03:31:04 7 process was ever used.

03:31:06 8 MR. ROGERS: That's my question. Was
03:31:08 9 it ever used.

03:31:10 10 MR. MURPHY: In any form, as a
03:31:12 11 washing process or as a utilization of solubles?

03:31:18 12 MR. ROGERS: In answer to your
:31:20 13 objection, then, I'll back up.

03:31:22 14 Q. Was this washing system that's
03:31:28 15 described in this memorandum to you ever used in
03:31:32 16 Project ART?

03:31:32 17 A. I don't have any recollection of
03:31:32 18 that.

03:31:38 19 Q. The reference to Bower Digester in
03:31:44 20 the first paragraph, was that Bower Digester ever
03:31:46 21 used in Project ART?

03:31:50 22 A. I don't have any recollection as to
03:31:52 23 whether it was or was not.

03:32:16 24 Q. Who is H. Grubbs?

:32:18 25 A. H. Grubbs would be Harvey Grubbs.

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03:32:20 2 Q. Is he still employed by Philip
03:32:20 3 Morris?

03:32:22 4 A. Yes, he is.

03:32:24 5 Q. Which department does he work in
03:32:24 6 today?

03:32:26 7 A. He works in R&D.

03:32:28 8 Q. And who is R. Prasad?

03:32:36 9 A. R. Prasad is Ravi Prasad.

03:32:38 10 Q. Does he still work for Philip Morris
03:32:38 11 today?

03:32:38 12 A. I believe so.

:32:40 13 Q. What department does he work in?

03:32:44 14 A. If he still works for Philip Morris,
03:32:46 15 I'm not aware of him moving from the R&D
03:32:46 16 organization.

03:33:04 17 Q. You testified that you have no
03:33:06 18 recollection as to whether or not this washing
03:33:10 19 system was ever used in Project ART. Do you have
03:33:14 20 any recollection as to whether any liquor
03:33:18 21 generated from washing stems in the ART process
03:33:22 22 was used in reconstituted tobacco?

03:33:24 23 A. No, I don't have any such
03:33:24 24 recollection.

:33:36 25 Q. Do you know who William Dunne is?

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03:33:38 2 A. I know the name, yes.

03:33:40 3 Q. Did you have any contact with him
03:33:44 4 while working in R&D?

03:33:46 5 MR. MURPHY: Objection to form.

03:33:50 6 Maybe you could be specific, Alex, as to what you
03:33:52 7 mean by "contact." Professional dealings with
03:33:56 8 him? Passed him in the hallway? Did he know him
03:33:56 9 by name? It could mean many things.

03:33:58 10 MR. ROGERS: I accept that
03:33:58 11 clarification.

03:34:00 12 Q. Did you have any professional contact
:34:04 13 with Mr. Dunne?

03:34:06 14 A. Not to the best of my recollection.

03:34:14 15 Q. Was he still in R&D while you were
03:34:14 16 there?

03:34:22 17 A. To the best of my recollection, he
03:34:28 18 was there until sometime in either late 1985 or
03:34:30 19 1986. So he would have been there during the
03:34:34 20 first years that I was in R&D.

03:34:36 21 Q. Are you familiar with any of the work
03:34:44 22 that he performed, research work on nicotine?

03:34:46 23 A. No, I'm not familiar with his work.

03:34:50 24 Q. Do you know who Victor Denoble is?

:34:50 25 A. I know the name.

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03:34:56 2 Q. Was he at Philip Morris in the
03:34:58 3 research and development department while you
03:35:00 4 were there, between 1982 and 1989?

03:35:02 5 A. I believe he was there at least
03:35:06 6 during some time period when I was in R&D.

03:35:08 7 Q. Do you know what the nature of the
03:35:10 8 work that he was performing was?

03:35:10 9 A. No, I wasn't familiar with that.

03:35:12 10 Q. Are you familiar with the behavioral
03:35:14 11 laboratory --

03:35:16 12 A. No.

:35:16 13 Q. -- within the research and
03:35:18 14 development department?

03:35:18 15 A. No, I am not.

03:35:24 16 Q. Do you know why Victor Denoble left
03:35:24 17 Philip Morris?

03:35:24 18 A. No, I don't.

03:35:24 19 Q. Do you know whether he was fired?

03:35:26 20 A. No, I don't.

03:35:28 21 Q. Do you know anything about the work
03:35:30 22 that was performed by Victor Denoble in the
03:35:34 23 research and development department at Philip
03:35:34 24 Morris?

:35:34 25 A. No, I don't.

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03:35:44 MR. ROGERS: David, at this time I'll
03:35:48 want to say, I checked back with my office, and
03:35:50 judging from the production logs of the documents
03:35:54 that Philip Morris has produced, we are unable to
03:35:56 identify any documents that came from the files
03:36:02 of Mr. Knudson. We will continue to check that
03:36:06 just to make sure. And I know you're in the
03:36:10 midst of a second round of document production.

03:36:12 Subject to our checking that, and to
03:36:14 whatever documents may be produced in the second
03:36:20 round of the document production, I have no
03:36:22 further questions at this time.

03:36:24 MR. MURPHY: Fine.

03:36:26 THE VIDEO OPERATOR: We're going off
03:36:28 the record. This ends the deposition. The time
03:36:28 on the screen is 3:36:32.

03:50:50 (Time noted: 3:36 p.m.)



DONALD KNUDSON

Subscribed and sworn to before me
this 21st day of MARCH, 1996.

Christ E. Hardin

My Commission Expires 4/30/97

MANHATTAN REPORTING CORP.

2058452257

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C E R T I F I C A T E

STATE OF NEW YORK)

: ss.

COUNTY OF NEW YORK)

I, LEE A. BURSTEN, a Registered
Professional Reporter and Notary Public within
and for the State of New York, do hereby certify:

That DONALD KNUDSON, the witness
whose continued deposition is hereinbefore set
forth (pages 198 through 353) was previously duly
sworn, and that such continued deposition is a
true record of the testimony of said witness.

I further certify that I am not
related to any of the parties to this action by
blood or marriage, and that I am in no way
interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto
set my hand this 14th day of July, 1995.


LEE A. BURSTEN, R.P.R.

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E X H I B I T S

DESCRIPTION	PAGE	LINE
(Knudson Exhibit 12 for identification, memo from D. L. Westra to J. M. Whitman, dated August 21, 1991.).....	221	3
(Knudson Exhibit 13 for identification, memo from Ted Sanders to distribution.)..	245	14
(Knudson Exhibit 14 for identification, the 1992 Philip Morris U.S.A. R&D product development department operational plans.).....	251	11
(Knudson Exhibit 15 for identification, memo from W. F. Kuhn to Ms. Claire Carcich dated September 10th, 1991.).....	263	8
(Knudson Exhibit 16 for identification, memo from L. F. Meyer to Mr. R. P. Heretick and Mr. H. L. Spielberg dated February 28th, 1986.).....	277	19
(Knudson Exhibit 17 for identification, memo from M. Hausermann to Mark A. Serrano dated July 26, 1985.).....	296	23
(Knudson Exhibit 18 for identification, memo from J. L. Charles and D. B. Knudson to Dr. K. S. Houghton dated December 16th, 1987.).....	316	24
(Knudson Exhibit 19 for identification, document describing the effects of aging of ART cigarettes on extractable nicotine and delivery of nicotine in smoke, dated 27 April 1989.).....	324	5
(Knudson Exhibit 20 for identification, Richmond processing plants, manufacturing plan, 1990 to 1995.).....	327	14

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E X H I B I T S (Continued)

DESCRIPTION PAGE LINE

(Knudson Exhibit 21 for identification,
memo from A. C. Lilly to distribution
dated August 10th, 1989.)..... 337 2

(Knudson Exhibit 22 for identification,
one-page memorandum from H. Spielberg
to J. E. Bickett dated September 28th,
1989.)..... 340 21

(Knudson Exhibit 23 for identification,
memorandum from H. Grubbs and R. Prasad
to Mr. D. M. Knudson, dated April 24,
1987.)..... 346 10

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